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EXPERT REBUTTAL REPORT OF MARTIN DIRKS

August 7, 2019

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EXPERT REBUTTAL REPORT OF MARTIN DIRKS**Table of Contents**

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I. Background and Assignment

1. I have been retained by Simpson Thacher & Bartlett LLP and Cooley LLP, Defendants' counsel. I submitted a report on June 21, 2019 in which I set forth my qualifications.¹ In my initial report I described the general processes reasonable investors would follow in analyzing a new company like Twitter in an emerging sector like the social media sector, assessed the information about Twitter available to investors during the Class Period, and evaluated whether the additional but-for disclosure during the Class Period of quarterly DAU and/or DAU/MAU ratio data would have mattered to them as they assessed the company.² In other words, I evaluated whether the additional but-for disclosures would have "significantly alter[ed] the 'total mix' of information available to them or significantly impact[ed] their deliberations of Twitter as a potential investment."³
2. Also on June 21, 2019, Plaintiffs submitted expert reports authored by Dr. Steven Feinstein and Dr. Sam Hui.⁴ I have been asked to respond to certain opinions proffered by Dr. Feinstein and Dr. Hui in their reports.
3. Specifically, I have been asked to respond to Dr. Feinstein's opinion that financial principles and certain analyst and Company statements establish the "economic importance" of the allegedly concealed information.⁵ I have also been asked to respond to Dr. Hui's opinions in the Hui Report regarding the importance of the DAU/MAU ratio.⁶
4. A full list of the materials I considered in completing my initial report and this rebuttal report is included as Appendix A.⁷

¹ Expert Report of Martin Dirks, dated June 21, 2019 ("Dirks Report" or "my initial report").

² Unless otherwise specified, all capitalized terms shall have the same meaning as in my initial report.

³ Dirks Report, ¶ 27.

⁴ Expert Report of Stephen P. Feinstein, Ph.D., dated June 21, 2019 ("Feinstein Report"); Expert Report of Sam Hui, Ph.D., dated June 21, 2019 ("Hui Report").

⁵ Feinstein Report, ¶ 9.

⁶ Hui Report, p. 7.

⁷ At my deposition, I expressed some uncertainty regarding what analyst reports I had considered in forming certain opinions in my initial report and had stated that while "[m]y recollection is not perfect," that "I believe I asked for all [analyst reports] that were in that range" from January 1, 2014 through the end of the Class Period, and that my Appendix C "document list may be incomplete," that my recollection at that time was also that I

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II. Summary of Opinions

5. In my initial report, I opined that reasonable investors would not have viewed quarterly disclosures of DAU and the DAU/MAU ratio during the Class Period “as significantly altering the total mix of information already available to them at that time or mattering to them as they evaluated and considered Twitter as an investment.”⁸
6. In contrast, Dr. Feinstein opines that the allegedly concealed information, namely Twitter’s DAU and the DAU/MAU ratio, was of “economic importance”⁹ Specifically, he notes that “analysts considered user engagement metrics and trends to be important information for valuing the Company’s stock.”¹⁰ Dr. Hui also discusses the “importance of user metrics”¹¹ and concludes that “[u]ser engagement is a key driver of revenue at social media companies including Twitter” and that “[t]he DAU/MAU ratio was the best measure of user engagement at Twitter during late 2014 and throughout the Class Period.”¹²
7. There are at least three major flaws with Dr. Feinstein and Dr. Hui’s opinions. First, and most critically, neither Dr. Feinstein nor Dr. Hui attempts to place his opinions within the context of the broader universe of information that was available to investors at the time. This included information both about Twitter and its actual revenue drivers and strategies, as well as general information about the emerging social media sector where different companies were competing for digital ad dollars using a variety of products and services they offered to advertisers. Indeed, both of Plaintiffs’ experts fail to answer the key

considered only the analyst reports listed in my Appendix C. Upon further reflection after the deposition, I realized that I inadvertently excluded from my Appendix C list of materials considered certain analyst reports, published primarily between January 1, 2014 and Analyst Day, and more than +/- five business days of certain events (including Analyst Day and Twitter’s Q4 2014, Q1 2015, and Q2 2015 earnings calls), that I had reviewed and considered in forming certain opinions set forth in my initial report and before my deposition in this matter. I have included those analyst reports in Appendix A, attached hereto. As noted, I considered those reports in forming certain opinions set forth in my initial report, and including those reports now in Appendix A does not change any of the opinions, calculations, or results set forth in my initial report. I have further considered these reports in forming my opinions in this rebuttal report. My rebuttal opinions are set forth in the remainder of this report.

⁸ Dirks Report, ¶ 102.

⁹ Feinstein Report, ¶¶ 90-92.

¹⁰ Feinstein Report, ¶ 88.

¹¹ Hui Report, pp. 8-9.

¹² Hui Report, p. 7.

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question that I did, which is: would the additional disclosures of DAU and/or the DAU/MAU ratio have mattered to a reasonable investor *given all the information already at their disposal*? Instead, they present their opinions about the importance of DAU and the DAU/MAU ratio in the abstract, stripped of any context, and thus fail to adequately describe how a reasonable investor would have assessed new disclosures about these metrics and whether such disclosures would have substantially altered their views of Twitter as a potential investment. This failure renders Plaintiffs' experts' opinions about the importance of DAU and the DAU/MAU ratio inaccurate and unreliable.

8. Second, Dr. Feinstein bases his opinions about the importance of DAU and the DAU/MAU ratio in part on analyst reports, Twitter's public statements, and valuation literature, but in doing so presents an incomplete, inaccurate, and flawed description of these documents. The analyst reports and Company statements that Dr. Feinstein relies upon often refer to "user engagement," which Dr. Feinstein improperly equates, almost exclusively, with DAU and the DAU/MAU ratio, ignoring that neither of these metrics expressly measure any action that directly leads to revenue for Twitter. Dr. Feinstein ignores the fact that, as the company had emphasized, there were numerous ways users could engage or interact with Twitter's platform and, accordingly, numerous ways to measure "user engagement." Dr. Feinstein also misleadingly suggests that many analysts expressed the desire for more disclosure by Twitter regarding user engagement and that user engagement was the driver of analysts' target price reductions after the Q2 2015 earnings announcement. Neither is accurate. A fair reading of analyst reports, Twitter's public disclosures, and financial literature that Dr. Feinstein cites demonstrate that Dr. Feinstein's opinions about the alleged importance of DAU and the DAU/MAU ratio have no sound factual basis.
9. Third, Dr. Hui's statistical analyses of the DAU/MAU ratio are irrelevant and fail to demonstrate that the decline in the ratio would have taken on any significance in the mind of a reasonable investor at the time. As I discussed in my initial report, the [REDACTED] ratio would not have mattered significantly to investors given that both DAU and MAU (the two components of the ratio) were [REDACTED] and that Twitter's corporate strategy was not focused on growing DAU or the DAU/MAU the ratio at the time. A natural consequence of the Company's focus on MAU growth over DAU growth is a [REDACTED]

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Further, [REDACTED] between Analyst Day and the Q1 2015 earnings announcement that Dr. Hui documents is consistent with the information that CFO Anthony Noto had communicated to the markets on Twitter's Q1 2015 earnings call.¹³ None of Dr. Hui's statistical analyses changes my opinion that the decline in the DAU/MAU ratio would not have significantly altered investors' opinions about Twitter.

10. In short, the opinions offered by Dr. Feinstein and Dr. Hui about the alleged importance of DAU and the DAU/MAU ratio are unpersuasive, inaccurate, and ultimately unreliable. They do not change my opinions that "a reasonable investor would not view additional disclosures by Twitter of quarterly average DAU and DAU/MAU ratio data during the Class Period as having significantly altered the "total mix" of information available to him or her, nor would those data occupy any significance in a reasonable investor's mind as he or she deliberated about whether to invest in Twitter."¹⁴

III. Dr. Feinstein's and Dr. Hui's Analyses Do Not Account for Information that Was Available to Twitter Investors

11. In Section IV of his report, Dr. Feinstein attempts to establish the "economic importance" of the allegedly concealed information, which, he claims, related in particular to two attributes, user growth and user engagement. In doing so, he makes arguments that ignore significant other information (including with regard to user growth and user engagement) that was available to investors that they would have taken into account in assessing Twitter as a potential investment during the Class Period. In failing to consider this publicly known information in assessing whether DAU and the DAU/MAU ratio were "economically important," Dr. Feinstein's presents an inaccurate and ultimately unreliable picture of what reasonable investors actually cared about and what would have altered the mix of information available to them during the Class Period.

¹³ In the Q1 2015 earnings call, Mr. Noto disclosed that the "DAU to MAU ratios in the quarter were similar to what they were by market relative to analyst day." Q1 2015 Earnings Call, p. 28.

¹⁴ Dirks Report, ¶ 32.

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12. Importantly, Dr. Feinstein’s analyses ignore Twitter’s own disclosures about the primary source and main drivers of its revenue,¹⁵ which include monetization of users (as captured, for example, by disclosed metrics such as percentage change in Ad Engagement and CPE), and information about new product and strategic initiatives to increase ad revenue.¹⁶ The complete absence of Twitter’s widely-discussed revenue drivers and strategic initiatives from Dr. Feinstein’s analyses is particularly notable since such disclosures were key in focusing investors’ attention on the firm’s changing business model and on metrics that mattered at the time. Starting at least as early as the Q3 2014 earnings call on October 27, 2014, Twitter executives were publicly discussing Twitter’s strategy that called for it to, among other things, “build the largest total audience in the world.”¹⁷ This audience, as Twitter saw it, comprised of MAU at the core, together with logged out users, and people Twitter reached via syndication. As described in my initial report, Twitter announced several initiatives to address and expand each of these three audience categories to reach its proclaimed goal of the “largest total audience in the world.”¹⁸ By ignoring Twitter’s strategic initiatives, Dr. Feinstein’s analyses circumvent the inconvenient fact that data on DAU and/or the DAU/MAU ratio would not have been particularly informative about the success or failure of such initiatives and, therefore, would not be of particular interest to investors at that time. This would be especially the case since Twitter did disclose metrics that were directly relevant to these initiatives and its revenue drivers at the time, including metrics that were informative about user growth (such as data on MAU) and about monetization of users, a fact that Dr. Feinstein also ignores.
13. For example, at its Analyst Day event Twitter detailed numerous opportunities to grow Twitter’s revenues and the strategic initiatives it was undertaking to exploit those opportunities.¹⁹ While, at this event, Mr. Noto did identify the potential *opportunity* to

¹⁵ As discussed in my initial report. See Dirks Report, ¶¶ 16-20.

¹⁶ See Dirks Report, ¶ 103.

¹⁷ Twitter, Inc., Q3 2014 Earnings Call Transcript, October 27, 2014, (“Q3 2014 Earnings Call”), pp. 3-4, 10. See also, Twitter, Inc., Corporate Analyst Meeting Transcript, November 12, 2014, (“Analyst Day Transcript”), pp. 9, 45-49.

¹⁸ Dirks Report, ¶ 75 n. 102.

¹⁹ “Financial Overview,” presentation by Anthony Noto at Twitter Analyst Day, November 12, 2014, p. 21.

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increase ad revenue by increasing its DAU/MAU ratio, the Company did not mention any specific initiatives that the Company was pursuing that directly addressed growth in DAU or the DAU/MAU ratio.²⁰

14. Dr. Feinstein's analyses also ignore Twitter's explicit and consistent message to investors prior to and during the Class Period that, at that point in time, its strategic focus was not on DAU growth or the DAU/MAU ratio.²¹ Even before the Analyst Day in November 2014, Twitter had made this clear to investors in Q3 2014 earnings call on October 27, 2014. For instance, in response to a question about engagement metrics on that call, Mr. Noto said:²²

Dick mentioned that we have an aspirational goal of having the largest daily audience in the world. We obviously do not provide the daily active user measurement.

We really don't have specific initiatives against that today. As those initiatives change and evolve over time, we could consider other measurements, but we're not doing that today.

15. Similarly, in the same call, in response to a question about the DAU/MAU ratio, Mr. Noto explicitly noted that:^{23, 24}

We get this question on every conference call, and what I'd like to clarify is a couple things. When the question is asked on what your DAU to MAU depends on what time of the year it is, and what portion of the overall user base you are focused on. So want to provide more specificity on this call, and then just be very clear that we're not going to continue to update DAU to MAU **until we have a specific strategy behind driving this measurement.**

²⁰ "Financial Overview," presentation by Anthony Noto at Twitter Analyst Day, November 12, 2014, pp. 16-21.

²¹ As I noted in my initial report, in the Q3 2014 earnings call on October 27, 2014, Mr. Noto stated that, at that point in time, "the Company was not focused on, and had no strategy to grow" DAU. *See* Dirks Report, ¶ 105.

²² Q3 2014 Earnings Call, pp. 9-10 (emphasis added).

²³ Q3 2014 Earnings Call, pp. 12-13 (emphasis added).

²⁴ In its Q2 2015 earnings call, Twitter confirmed the lack of strategic focus on DAU during the Class Period when Anthony Noto stated that "As it relates to the MAU-to-DAU ratio and other factors, what I'd say is the DAU-to MAU-ratio has gone down over the time period that I articulated because we've grown MAUs faster than DAUs. And we have not historically focused on daily active user growth, and that's something in 2016 that we will all consider more." *See* Twitter, Inc., Q2 2015 Earnings Call Transcript, July 28, 2015, ("Q2 2015 Earnings Call"), p. 15.

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16. Mr. Noto reinforced this message (that Twitter was not focused on growing DAU or the DAU/MAU ratio) at Analyst Day on November 12, 2014 when he explained that while the Company's long-term goal was to become a daily product, "[t]oday we haven't really focused on DAU as a metric and we haven't focused on it from an experience standpoint."²⁵
17. Given the disclosures above, there is no basis to assume, as Dr. Feinstein apparently does, that disclosure of DAU and/or the DAU/MAU ratio, metrics on which the Company was not focused, would have been viewed by investors as changing the total mix of information in the but-for world.
18. Dr. Feinstein also fails to acknowledge that, leading up to and during the Class Period, the mix of information available to investors included ad revenue itself as well as several metrics that were directly related to ad revenue as well as metrics from third-party sources such as ComScore.²⁶ Twitter had consistently disclosed, on a quarterly basis, total revenue, ad revenue, MAU, and percentage change in Ad Engagement and CPE. These disclosures had allowed analysts and investors to gauge trends in the user base and the monetization of that user base.
19. All of this information about Twitter's actual revenue drivers and new strategic initiatives would have been critical to assessing Twitter during the Class Period, and was information that reasonable investors would have taken into account at the time. Indeed, as I set forth in my initial report, contemporaneous analyst reports reflect that all of this publicly known information was, indeed, taken into account by the market, and factored into analysts' assessments of Twitter at the time.²⁷ Furthermore, as stated in my initial report, "[a] reasonable investor would have understood that this trend of MAU growth outpacing DAU growth during the Class Period was in-line with and explained by the Company's disclosed lack of focus around growing DAU *and* its disclosed focus on growing MAU."²⁸ Moreover, as I opined in my initial report, given the availability of such other more

²⁵ Analyst Day Transcript, p. 83.

²⁶ Dirks Report, ¶ 86, n. 129.

²⁷ Dirks Report, ¶¶ 81-101.

²⁸ Dirks Report, ¶ 109 (emphasis in original).

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pertinent information that related to the Company's future revenue prospects, the but-for disclosure of DAU or DAU/MAU ratio would not have significantly changed the mix of information reasonable investors would have considered in evaluating Twitter as a potential investment.²⁹ Dr. Feinstein analyzes the "economic importance" of DAU and the DAU/MAU ratio in the abstract, rather than addressing what mattered to reasonable investors within the framework of what the market already knew at the time, as I did.

20. Similar to Dr. Feinstein, Dr. Hui also fails to place his analysis within the broader universe of Twitter-related information known to the market at the time. As I have noted above, this information included, among many other things, information about Twitter's revenue drivers and business strategy. Indeed, Dr. Hui did not assess what information was known to investors at the time and whether additional disclosures of quarterly DAU/MAU ratio data would have significantly altered the mix of information available to a reasonable investor and would have mattered to them in their assessment of Twitter as a potential investment. For instance, as the Hui Report itself acknowledges, Twitter's Ad Engagements (a monetization metric directly tied to the Company's revenue) and the DAU/MAU ratio were [REDACTED],³⁰ suggesting that this ratio was not particularly informative about revenue. In light of the more revenue-informative Ad Engagement metric, it is difficult to see why reasonable investors' revenue expectations and investment decisions in the but-for world would be affected by the additional disclosure of DAU and/or the DAU/MAU ratio.
21. Dr. Hui asserts that the DAU/MAU ratio measures user engagement and that a higher level of user engagement "generally increases both the 'volume' and 'quality' of advertising supply," which, in turn, drives revenue.³¹ Setting aside the accuracy of such assertions,³²

²⁹ See, e.g., Dirks Report, ¶ 32.

³⁰ Hui Report, p. 13.

³¹ Hui Report, p. 11. See also Hui Report, pp. 16-19.

³² [REDACTED]. As I mentioned in my initial report, "For example, [REDACTED]"

[REDACTED] In my experience, a metric that is not well correlated with revenue is not a particularly helpful metric

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Dr. Hui does not claim that Twitter was ad supply constrained during the Class Period or that it had any issues with the volume of supply (i.e., users) that adversely impacted advertiser spend. In fact, the Company publicly stated that it was *not* currently supply constrained in Q2 2015.³³ Thus, if the volume of ad supply was not perceived by investors to be a concern during the Class Period, there is no reason to believe that the DAU/MAU ratio would have provided the market with incremental value-relevant information, even if Dr. Hui's opinion that a higher DAU/MAU ratio is an indicator of the volume of Twitter's ad supply were true.

22. Further, Dr. Hui grossly mischaracterizes the Company's statements and the market's views about the DAU/MAU ratio. Dr. Hui opines that, "DAU/MAU matched Twitter's corporate strategy to 'strengthen the core.'"³⁴ In the Q3 2014 earnings call (as well as in subsequent calls and presentations, including at Analyst Day on November 12, 2014), Mr. Costolo identified three objectives that Twitter was focused on across its total audience. The first objective was to "[S]trengthen the core. We have to continue to grow our monthly active users and make Twitter an increasingly daily use case for them."³⁵ Based partly on statements like this, Dr. Hui concludes that the definition of strengthening the core "is synonymous with the DAU/MAU metric."³⁶ In reaching these conclusions Dr. Hui ignores the Company's explicit statements I quoted above, that it had no "specific initiatives against" the DAU/MAU ratio³⁷ and no "specific strategy behind driving" the DAU/MAU ratio,³⁸ and was, in fact, focused on growing MAU rather than DAU.³⁹ A likely

to me (or any reasonable investor) in understanding the revenue increase, and is not likely a driver of that revenue." See Dirks Report, ¶ 109.

³³ Q2 2015 Earnings Call, p. 6.

³⁴ Hui Report, p. 19.

³⁵ Q3 2014 Earnings Call, p. 3.

³⁶ Hui Report, p. 20.

³⁷ Q3 2014 Earnings Call, pp. 9-10.

³⁸ Q3 2014 Earnings Call, pp. 12-13.

³⁹ In his prepared remarks on Analyst Day, Mr. Costolo explicitly and repeatedly equated the "core" with monthly active users. For instance, he said, "Our first objective is to strengthen **the core, our monthly active users**. ... Today you'll hear about a number of initiatives we have underway to grow our **core of monthly active users**" (See Analyst Day Transcript, November 12, 2014, p. 4.) Earlier in the same speech he had stated that "[t]here are still yet more unique monthly users, who consume Twitter content in syndication across the entire

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consequence of this focus on growing the denominator would be a declining DAU/MAU ratio, even if MAU and DAU were both increasing (as they were).

23. By failing to assess the alleged importance of DAU and the DAU/MAU ratio within the broader context of all that was known and considered by the market, Dr. Feinstein and Dr. Hui offer inaccurate and unreliable opinions about how a reasonable investor would have viewed additional DAU and/or DAU/MAU ratio disclosures during the Class Period. My opinion remains unchanged after my review of the Feinstein and Hui Reports because both these reports have failed to examine the question of whether the additional disclosures of DAU and/or the DAU/MAU ratio would have significantly altered the total mix of information available to a reasonable investor. As I explained in my initial report, based on my review of the facts and information available during the Class Period to investors, a disclosure of Twitter's DAU and the DAU/MAU ratio during the Class Period in the but-for world would *not* have significantly altered the total mix of information already available to reasonable investors at the time to assess Twitter as a potential investment.

IV. The Feinstein Report Presents an Inaccurate and Flawed Description of Analyst Reports, Twitter's Risk Disclosures, and Valuation Literature Which Do Not Suggest That Disclosures of DAU and/or the DAU/MAU Ratio Would Have Mattered to Investors during the Class Period

24. Dr. Feinstein's opinions are flawed and unreliable for the separate reason that they are based on Dr. Feinstein's mischaracterization of analyst commentary, Company disclosures, and valuation literature about the alleged importance of DAU and the DAU/MAU ratio. As discussed below, Dr. Feinstein overstates the significance those sources ascribe to "user engagement" generally in understanding Twitter's strategies and revenue prospects. As further discussed below, a fair reading of those sources demonstrates that Dr. Feinstein's conclusion that DAU and the DAU/MAU ratio were of "economic importance" and value-relevant for Twitter during the Class Period is overstated. Those sources in fact confirm,

web, and now with the introduction of our mobile development platform Fabric, mobile application users can consume Twitter content within tens of thousands of mobile apps around the world. **But it all starts with the core, our monthly active logged in users.**" See Analyst Day Transcript, November 12, 2014, p. 4 (emphases added); See also, "Financial Overview," presentation by Anthony Noto at Twitter Analyst Day, November 12, 2014, p. 25 ("We have a significant product roadmap that we believe positions us to grow core (MAU) users...").

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as I have opined, that at that time Twitter's value and cash flows were driven by other factors and metrics, including, principally advertisement-related metrics and initiatives that the Company publicly discussed extensively in its SEC filings and on earnings calls.

A. Analyst Commentary Does Not Support Dr. Feinstein's Opinions and Does Not Suggest That Disclosures of DAU and/or the DAU/MAU Ratio Would Have Mattered to Investors during the Class Period

25. When analyzing analyst commentary, Dr. Feinstein focuses on "user engagement" rather than on DAU or the DAU/MAU ratio specifically. These terms (user engagement, DAU, and the DAU/MAU ratio), however, are not synonymous. User engagement has many facets and can be measured, for instance, by Ad Engagements, number of retweets, Click-Through Rate, favorites, etc. Twitter management highlighted the fact that there are numerous ways to think about engagement on numerous occasions. For example, in the Q1 2015 earnings call, Mr. Noto responded to a question about the best way to monitor engagement by saying:⁴⁰

In terms of engagement metrics, there's a lot of different metrics that we look at internally. There's not one metric for engagement, and so I can give you a sense of some of them and quite frankly we would like to give you more visibility on this but there's a number of different measurements. So DAU is one measurement of engagement. We talked about that at analyst day it's a measurement that is dependent by market and you could have a mix shift so that could be a little bit misleading DAU to MAU ratios in the quarter were similar to what they were by market relative to analyst day.

Other engagement metrics that we look at are Tweets per day or favorites and retweets direct messages searches are a number of searches actually accelerate on year over year growth basis in the quarter, direct messages also accelerated on a year-over-year basis in the quarter.

26. At Analyst Day, even before the Class Period, Mr. Noto explained that "there's a lot of measurements of engagement – ...retweet[s], that's a measure of engagement and it's really valuable because it creates the virality and the network effect. Favorites, another level of an engagement to click on an ad and there's a lot of measurement of engagement."⁴¹

⁴⁰ Twitter, Inc., Q1 2015 Earnings Call Transcript, pp. 27-28.

⁴¹ Analyst Day Transcript, p. 91.

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27. Dr. Feinstein also conveys the inaccurate impression that there were pervasive analyst complaints about the absence of disclosures about metrics that purportedly measure user engagement, such as TLV or the DAU/MAU ratio. For instance, the Dr. Feinstein quotes Janney Capital as saying that the discontinuation of the TLV metric “impairs transparency” as his lone example of analysts’ belief that “[u]ser engagement metrics and trends were necessary to accurately value Twitter’s business and stock.”⁴² However, the cherry-picked nature of Dr. Feinstein’s review of analyst commentary is evident from the fact that Dr. Feinstein failed to quote that this analyst also said in the same sentence that, “the incremental growth from non-TWTR ad platforms would be difficult to track regardless” and that the analyst did not express any concern about not being able to accurately value Twitter at that time.⁴³
28. As discussed in my initial report, once Twitter stopped disclosing the TLV per MAU metric, “no analyst remarked that the Company’s discontinuation of TLV in Q1 2015 precluded them from assessing the Company’s value or future ad revenue” and “few said anything at all about the discontinuation, other than noting the reason for the Company’s decision to discontinue.”⁴⁴ In fact, as discussed in my initial report, when Twitter’s decision to discontinue reporting TLV/MAU beyond Q4 2014 was first announced, only two analysts at the time (Barclays and Rosenblatt) expressed a desire for the Company to provide DAU or DAU/MAU metrics as a replacement.⁴⁵ While several of the post-Analyst Day reports that Dr. Feinstein quotes comment on Twitter’s just-announced DAU/MAU-

⁴² Feinstein Report, ¶ 91.

⁴³ Wible, Tony and Sankar, Murali, “Poor Sentiment Amplifies Strong Engagement and Pricing,” *Janney Montgomery Scott*, February 6, 2015, TWTR_SHEN_00114271, p. 1.

⁴⁴ Dirks Report, ¶ 86.

⁴⁵ Dirks Report, ¶¶ 89-90; Pyykkonen, Martin, “At Investor Day, TWTR Needs to Clearly Articulate a Plan,” *Rosenblatt Securities*, November 12, 2014, p. 2. (“[w]e would like to see TWTR report DAUs (Daily Active Users) on a regular basis at some point going forward. On yesterday’s conference call, TWTR indicated that the DAU/MAU ratio is in a low 50s percent to high 40s percent range for its top 5-20 geographic markets. As with FB, which reports DAUs and MAUs in total and specifically for mobile, we think DAU/MAU would be a proxy for usage and engagement frequency, even though TWTR has indicated that their relative focus and investment priority is not squarely on driving daily usage frequency.”); Vogel, Paul, *et al.*, “Flight Plan - Analyst Day Thoughts,” *Barclays*, November 13, 2014, p. 1. (“If daily users are what the mission is, daily or daily/monthly metrics should be key to proving out success.”).

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specific opportunity, only one of the reports (the same Barclays report mentioned above) implied that Twitter should disclose DAU or the DAU/MAU ratio going forward.⁴⁶

29. While it is true, as Dr. Feinstein notes, that at each of Twitter's Q4 2014 and Q1 2015 earnings calls there was at least one question about how to track user engagement,⁴⁷ it is also true, as discussed further below, that incredibly few analyst firms – just three of 56 that covered Twitter at any time from January 1, 2014 through the end of the Class Period – expressed a desire to specifically see Twitter disclose DAU or the DAU/MAU ratio, even after it stopped disclosing the TLV/MAU metric.⁴⁸ This evidence suggests that there was no widespread concern among analysts about the lack of disclosure regarding DAU or the DAU/MAU ratio.
30. Dr. Feinstein also fails to note that Twitter was not the exclusive source for user engagement data. Analysts had access to data from third parties such as ComScore, and some used this data to compare Twitter to other social media platforms such as Facebook. For instance, in my initial report I noted that:⁴⁹

Several other analysts had relied on ComScore data prior to the Class Period. For example, Atlantic Equities used the ComScore metric of 'Mins per day per MAU' to compare Facebook, Instagram, and Twitter user engagement, UBS Research used ComScore data on 'Mobile Share of Time Spent on Platform' to compare a variety of websites/apps, Oppenheimer & Co. used ComScore's data on social mobile application engagement (minutes per UV per day), and Morgan Stanley considered data on unique users and pages viewed provided by ComScore, as well as metrics that were based on a combination of data from Twitter, ComScore, and other sources (e.g., Page views/DAU/month, minutes/MAU/per month).

31. The Feinstein Report appears to also suggest, improperly, that analysts were concerned about user engagement as much as user growth. This is misleading because, as evident after the Q2 2015 earnings announcement where Twitter disclosed adverse news about both user growth and a lower DAU/MAU ratio, only about half the analysts commented at all

⁴⁶ Feinstein Report, ¶ 31.

⁴⁷ Feinstein Report, ¶¶ 38, 48.

⁴⁸ *See also*, Dirks Report, ¶¶ 89, 91.

⁴⁹ Dirks Report, ¶ 86, n. 129.

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the decline in the DAU/MAU ratio, and in most instances simply reported the news rather than analyzed Twitter's DAU-related disclosures in any detail. For instance, Dr. Feinstein quotes excerpts from analyst reports published after the Q2 2015 earnings release to illustrate that "analyst commentary was focused on the declining user engagement and disappointing user growth outlook."⁵⁰ In fact, these quotes say little about user engagement, DAU, or the DAU/MAU ratio and mostly discuss the Company's disclosures about prospective user growth.

B. Dr. Feinstein Misleadingly Suggests That Analysts Focused on the DAU/MAU Ratio When Lowering Their Twitter Price Targets

32. In its Q2 2015 earnings release and conference call the Company disclosed, among other things, that even though it had exceeded its revenue and EBITDA targets, the Company did "not expect to see sustained meaningful growth in MAUs [for] a considerable period of time"⁵¹ and that "DAU/MAU for our top 20 markets in Q2 was approximately 44% vs the 48% we shared with you at our Analyst Day which was for the first three quarters of 2014."⁵²
33. Dr. Feinstein provides quotes from four analysts at the time that he says show that "[d]espite the better than expected financial results, analyst commentary was focused on the declining user engagement and disappointing user growth outlook."⁵³ However, only one of these quotes (from Wells Fargo) mentions DAU or the DAU/MAU ratio.⁵⁴

⁵⁰ Feinstein Report, ¶ 57. As I discuss further below, of the 13 excerpts that Mr. Feinstein quotes in support of his claim that "analysts reduced their price targets and valuations, citing the Company's poor growth trajectory in user base and user engagement," only four excerpts mention "engagement," only two of those mention DAU or the DAU/MAU ratio, and one of those (Bernstein) refers to the DAU/MAU ratio as a "very imperfect metric for user engagement" (See Feinstein Report, ¶ 58).

⁵¹ Q2 2015 Earnings Call, p. 5.

⁵² Q2 2015 Earnings Call, p. 6.

⁵³ Feinstein Report, ¶ 57. The four analysts are Morgan Stanley, Wells Fargo, BMO, and RBC.

⁵⁴ Dr. Feinstein also quotes four analyst reports published subsequent to the Q1 2015 earnings announcement to support his belief that "several analysts reduced their price targets and valuation multiples, citing poor revenue and user growth." (Feinstein Report, ¶ 51). However, none of the four quotes he has chosen mention the DAU/MAU ratio or even user engagement.

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34. Dr. Feinstein further provides 13 quotes from 10 analysts that he claims illustrate that, in Q2 2015, “analysts reduced their price targets and valuations, citing the Company’s poor growth trajectory in user base and user engagement.”⁵⁵ However, only two of these quotes (from Bernstein and Rosenblatt) mention DAU or the DAU/MAU ratio, and neither of these analysts support Dr. Feinstein’s position regarding the “economic importance” of the DAU/MAU ratio. In fact, even the quote from Bernstein that Dr. Feinstein selected to include in his report indicated that the DAU/MAU ratio “is a very imperfect metric for user engagement.”⁵⁶ Meanwhile, Rosenblatt, which Dr. Feinstein also quotes to support his statement about analysts reducing their target prices, did not, in fact, revise its target price or stock recommendation at the time.⁵⁷
35. Moreover, as I discuss further below, of the 36 analyst reports released in the 5 business days after the Q2 earnings announcement, 19 mentioned the DAU/MAU ratio and 17 did not. Many of those that did mention the DAU/MAU ratio simply reported the change in the ratio but offered no analysis of the change. This includes several analysts that reduced their target prices (though to levels still above Twitter’s then-current stock price). For example:
- Nomura (one of the analysts quoted by Dr. Feinstein) reduced its target price from \$39 to \$33 but does not mention the DAU/MAU ratio in its report and discussed only “the persistence of tepid user growth” in the discussion of its target price reduction.⁵⁸

⁵⁵ Feinstein Report, ¶ 58. The 13 quotes include three from Bernstein, two from Cowen and Company, and one each from Stifel, Evercore, Citi, BMO, Bank of America Merrill Lynch, Atlantic Equities, Rosenblatt, and Nomura.

⁵⁶ Feinstein Report, ¶ 58, citing Kirjner, Carlos, *et al.*, “Twitter 2Q15 Review: Stock Won’t Work If Users Don’t Grow,” *Bernstein*, July 29, 2015, p. 2. (“This ratio is a very imperfect metric for user engagement, but, if anything, it points to declining user engagement.”)

⁵⁷ Pyykkonen, Martin, “Still Searching For Mass Market Appeal and Usage,” *Rosenblatt Securities*, July 29, 2015, TWTR_SHEN_00005283, p. 1.

⁵⁸ DiClemente, Anthony and Kevin Rippey, “Bluebird Sings the MAU Blues; TP to \$33,” *Nomura*, July 29, 2015, TWTR_SHEN_00005236, p. 1.

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- Canaccord Genuity reduced its target price from \$52 to \$45 without mentioning the news regarding the DAU/MAU ratio, mentioning only user growth in the discussion of its valuation.⁵⁹
- FBN Securities reduced its target price from \$55 to \$50, without any mention of DAU/MAU ratio disclosure.⁶⁰
- J.P. Morgan reduced its target price from \$55 to \$50, without any mention of DAU/MAU ratio disclosure.⁶¹

36. Furthermore, as I discussed in my initial report, not a single analyst revised its buy/sell recommendations after the Q2 2015 earnings announcement (whether motivated by the disclosure of the decline in the DAU/MAU ratio or otherwise).⁶²

C. The Analyst Commentary Cited by Dr. Feinstein Shows That, Throughout the Class Period, Analysts Were Informed About Slowing User Growth

37. Dr. Feinstein argues that Twitter hid a declining trend in user growth during the Class Period.⁶³ However, the Company disclosed significant information about the size of its user base and user growth (much of which is acknowledged by Dr. Feinstein), as evidenced by the following:

- The Company consistently reported MAU every quarter and also gave guidance about quarter-ahead MAU through the Class Period.⁶⁴
- In earnings calls the Company disclosed reasons for the quarter-over-quarter changes in MAU.⁶⁵

⁵⁹ Graham, Michael, et al., “Q2 strong revenue, weak MAUs; expect more of the same in H2/15,” *Canaccord Genuity*, July 28, 2015, TWTR_SHEN_00005054, p. 1.

⁶⁰ Seyrafi, Shebly, “TWTR: Monetization Impresses by User Growth Doesn’t– Lowering PT to \$50,” *FBN Securities*, July 29, 2015, TWTR_SHEN_0000510, p. 1.

⁶¹ Anmuth, Doug, et al., “Twitter, Inc. Remains a Show-Me Story, But We Continue to Believe There’s More Value in the Platform; Overweight, \$50 PT,” *J.P. Morgan*, July 29, 2015, TWTR_SHEN_00005215, p. 1.

⁶² Dirks Report, ¶ 93 and Exhibit 6.

⁶³ See, e.g., Feinstein Report, ¶¶ 21, 73.

⁶⁴ See, e.g., Feinstein Report, ¶¶ 34, 44, 47, 55-56.

⁶⁵ See, e.g., Feinstein Report, ¶¶ 35, 47, 55-56.

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- When management did not have clarity on quarter-ahead MAU, it admitted as much in its conference calls and provided reasons for the lack of clarity.⁶⁶
 - Analyst commentary that Dr. Feinstein cites shows that analysts paid attention to and understood management's disclosures on user growth as measured by MAU.⁶⁷
38. As Dr. Feinstein himself cites, many analysts commented on Twitter's slowing user growth as early as the announcement of Twitter's Q4 2014 results in February 2015,⁶⁸ and continued to do so throughout the Class Period, reflecting that they understood this trend.⁶⁹ Furthermore, as I showed in Exhibit 2A of my initial report, the Company's year-over-year growth rate in MAU had declined each quarter since at least Q1 2012, a trend that would have been apparent to investors.
39. Even after the disappointing user growth outlook disclosed on July 29, 2015, analysts did not express the belief that Twitter revealed information on user growth that it had previously concealed or that earlier disclosures of the DAU/MAU ratio would have allowed them to better predict the slowing growth. For instance, J.P. Morgan analysts noted that, "[O]verall we don't think there were many surprises from earnings, perhaps just more clear acknowledgement from mgmt that meaningful MAU growth will take time as the product has to improve and become simpler to use."⁷⁰ Oppenheimer and Co. wrote, "TWTR's 2Q MAU deceleration **reaffirms** the company's struggles to add users, driven by products challenges and competitive pressures."⁷¹

⁶⁶ Twitter management commented about the lack of visibility on Q2 2015 MAU growth in the Q1 2015 earnings call on April 29, 2015. *See* Feinstein Report, ¶ 47.

⁶⁷ *See e.g.*, Feinstein Report, ¶ 39, 49, 51.

⁶⁸ Dr. Feinstein quotes several analysts commenting, after Twitter's Q4 2014 earnings release, that user growth had slowed. *See* Feinstein Report, ¶ 39.

⁶⁹ Dr. Feinstein quotes several analysts commenting, after Twitter's Q1 2015 earnings release, on Twitter's slower user growth outlook for Q2 2015. *See* Feinstein Report, ¶ 51.

⁷⁰ Anmuth, Doug, *et al.*, "Twitter, Inc. Remains a Show-Me Story, But We Continue to Believe There's More Value in the Platform; Overweight, \$50 PT," *J.P. Morgan*, July 29, 2015, TWTR_SHEN_00005215, p. 1.

⁷¹ Helfstein, Jason, *et al.*, "MAUs Decelerate; Reiterate Perform Rating," *Oppenheimer and Co.*, July 29, 2015, TWTR_SHEN_00005246, p. 1 (emphasis added).

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40. In short, despite his claims, Dr. Feinstein has failed to provide any evidence from analyst and media commentary that shows that analysts were misled about slowing user growth during the Class Period.⁷²

D. Dr. Feinstein Misinterprets Twitter's Risk Disclosures

41. The Feinstein Report contains a section titled "Public Company Statements Confirm The Economic Importance Of The Allegation-Related Information to The Company's Business Model and Prospects."⁷³ In this section, Dr. Feinstein quotes from Twitter's 2014 10-K in his attempt to establish that "the Company acknowledged the importance of its user growth trends and user engagement trends."⁷⁴
42. However, Twitter's 2014 10-K does not equate user engagement exclusively (or at all) with DAU or the DAU/MAU ratio. As I have discussed above, Twitter publicly discussed numerous engagement metrics.⁷⁵ In fact, the very section of the 10-K that Dr. Feinstein quotes makes it clear that the discussion of engagement in that section encompasses a broader definition than what the DAU/MAU metric captures. If anything, the discussion of engagement in that section of the 10-K has more to do with engagement with ads than how frequently users are logging into the platform. For example, the first risk disclosure that Dr. Feinstein cites⁷⁶ also provides that "[t]o the extent our user growth rate slows, our success will become increasingly dependent on our ability to increase levels of ad engagement on Twitter" and further explains that:⁷⁷

We generate a substantial majority of our revenue based upon **engagement by our users with the ads that we display**. If people do not perceive our products and services to be useful, reliable and trustworthy, we may not be able to attract users or increase the frequency of their engagement with our platform and the ads that we display. A number of consumer-oriented websites that achieved

⁷² Nor has Dr. Feinstein provided any analysis to show that analysts or investors would have been able to better predict Twitter's slowing user growth had DAU or the DAU/MAU ratio been disclosed more regularly.

⁷³ Feinstein Report, ¶¶ 79-87.

⁷⁴ Feinstein Report, ¶ 80.

⁷⁵ See, e.g., Q1 2015 Earnings Call Transcript, pp. 27-28.

⁷⁶ Feinstein Report, ¶ 17.

⁷⁷ Twitter, Inc., FY 2014 Form 10-K for the fiscal year ended December 31, 2014, filed March 2, 2015 ("Twitter 2014 10-K"), p. 11 (emphasis added).

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early popularity have since seen their user bases or levels of engagement decline, in some cases precipitously. There is no guarantee that we will not experience a similar erosion of our user base or engagement levels.

43. Dr. Feinstein provides no evidence that the public statements the company made at the time specifically identify the DAU/MAU ratio as the only user engagement metric, and in fact (as discussed) the company has many user engagement metrics (including Ad Engagements).
44. In addition, Dr. Feinstein quotes a text by Prof. Damodaran to support his claim of the “particular importance of growing user base and increasing user engagement for Internet and social media companies.”⁷⁸ However, none of the passages he cites mention “user engagement” or the DAU/MAU ratio.

V. Dr. Hui’s Report Fails to Demonstrate That Reasonable Investors Would Have Viewed the [REDACTED] as Significant In Assessing Twitter

45. Using daily, monthly, and quarterly data, Dr. Hui purports to show that the [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].⁷⁹
46. However, as discussed in my initial report and above in this rebuttal report, the disclosure of the DAU/MAU ratio would not have significantly changed the total mix of information available to reasonable investors during the Class Period. As I discussed in my initial report:⁸⁰

[W]hile the [REDACTED], a reasonable investor would not have viewed that data as providing a significantly different picture of Twitter than they already had. As an initial matter, a reasonable investor would have recognized that the DAU/MAU ratio was [REDACTED]
[REDACTED]

⁷⁸ Feinstein Report, ¶ 76.

⁷⁹ Dr. Hui’s quarterly analysis appears to focus on the six quarters from Q1 2014 to Q2 2015; his monthly analysis appears to focus on the 14 months from January 2014 to February 2015; his daily analysis covers October 1, 2014 to July 28, 2015. *See* Hui Report, pp. 36-43.

⁸⁰ Dirks Report, ¶ 109 (emphasis in original).

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[REDACTED] A reasonable investor would have understood that this trend of [REDACTED] during the Class Period was in-line with and explained by the Company's disclosed lack of focus around growing DAU *and* its disclosed focus on growing MAU. Further, a reasonable investor would have also been aware of the trend that newer cohorts of users were less engaged than older cohorts, as the Company disclosed. Thus, the [REDACTED] [REDACTED] would not have been viewed by a reasonable investor as surprising or providing meaningfully new information to the market.

47. Dr. Hui's tests purportedly demonstrating that the [REDACTED] [REDACTED] are irrelevant and fail to demonstrate that such information, even if true, would have been important to a reasonable investor at the time. His tests simply show that there is statistical evidence that the DAU/MAU ratio was in decline.
48. Further, Dr. Hui documents only a [REDACTED] [REDACTED].⁸¹ Had this [REDACTED] [REDACTED] even if statistically significant, been disclosed, it would not have significantly changed the mix of information available to investors, especially in light of the fact that Mr. Noto had already informed investors that the "DAU to MAU ratios in the quarter were similar to what they were by market relative to analyst day."⁸²
49. Finally, as I discussed in my initial report, these [REDACTED] would not have been important to investors given that [REDACTED] [REDACTED] and that Twitter's corporate strategy was not focused on growing the ratio at the time.⁸³ None of Dr. Hui's statistical analyses changes my opinion

⁸¹ [REDACTED]

⁸² Q1 2015 Earnings Call, pp. 27-28 ("So DAU is one measurement of engagement. We talked about that at analyst day it's a measurement that is dependent by market and you could have a mix shift so that could be a little bit misleading DAU to MAU ratios in the quarter were similar to what they were by market relative to analyst day.").

⁸³ Dirks Report, ¶ 109.

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that the [REDACTED] would not have significantly altered investors' assessment of Twitter as a potential investment.

VI. Additional Commentary from Analyst Reports Cited By Dr. Feinstein Does Not Change My Opinion

50. In his report, Dr. Feinstein cited fifteen analyst reports from the beginning of 2014 through the end of the Class Period that I had not reviewed in preparing my initial report. To ensure that my review of analyst reports is comprehensive, I have incorporated these fifteen documents into my analyses.⁸⁴ As discussed below, taking these reports into account does not change any of the opinions set forth in my initial report nor meaningfully change any of the analyses I presented therein.
51. First, these additional analyst reports also do not alter my opinion that very few of the analysts that covered Twitter from the beginning of 2014 through the end of the Class Period expressed in the reports that I reviewed that the DAU/MAU ratio was important to them in understanding the Company's value, or suggested that the Company should start disclosing it. Specifically, I identified 56 analyst firms that issued at least one report covering Twitter during that time frame. Of those, only three (Barclays,⁸⁵ Rosenblatt,⁸⁶

⁸⁴ In preparing my initial report and this rebuttal report, I have reviewed 523 analyst reports, which are listed in Appendix A to this report. In contrast, Dr. Feinstein only quotes 42 analyst reports and lists an additional 44 analyst reports in his Exhibit 1.

⁸⁵ Vogel, Paul, *et al.*, "Flight Plan - Analyst Day Thoughts," *Barclays*, November 13, 2014, p. 1. ("If daily users are what the mission is, daily or daily/monthly metrics should be key to proving out success."); Vogel, Paul, *et al.*, "Twitter Inc. – Waiting for Lightning to Strike," *Barclays*, July 29, 2015, p. 1 ("Importantly, engagement seems to have fallen off a bit, as the company shared that daily active users as a percentage of monthly actives is now 44% in the top 20 markets, down from the 48% reported at its analyst day nine months ago.").

⁸⁶ Pyykkonen, Martin, "At Investor Day, TWTR Needs to Clearly Articulate a Plan," *Rosenblatt Securities*, November 12, 2014, p. 2 ("[w]e would like to see TWTR report DAUs (Daily Active Users) on a regular basis at some point going forward. On yesterday's conference call, TWTR indicated that the DAU/MAU ratio is in a low 50s percent to high 40s percent range for its top 5-20 geographic markets. As with FB, which reports DAUs and MAUs in total and specifically for mobile, we think DAU/MAU would be a proxy for usage and engagement frequency, even though TWTR has indicated that their relative focus and investment priority is not squarely on driving daily usage frequency."); Pyykkonen, Martin, "Downgrading to Neutral; Limited Execution in Key Areas," *Rosenblatt Securities*, April 29, 2015, p. 2 ("... [w]e still expect Twitter to report MAUs for the foreseeable future, even as TLVs are replaced as a usage metric. Given that, we would also like to see Twitter report DAUs (Daily Active Users) on a regular basis at some point, e.g., the only comment for 1Q15 DAUs was that they were similar in terms of geographic mix as of late last year. Twitter had indicated late last year that the DAU/MAU ratio was in a low 50s percent to high 40s percent range for its top 5-20 geographic markets. As with Facebook, which reports DAUs and MAUs in total and specifically for mobile, we think DAU/MAU would be a proxy for usage and engagement frequency.").

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and Wells Fargo⁸⁷) ever indicated that they considered the DAU/MAU ratio important or something that the Company should regularly disclose.⁸⁸

52. Additionally, I examined whether the additional analyst reports would change my findings regarding changes in analyst recommendations after the Q1 and Q2 2015 earnings calls. Four of the additional reports were published subsequent to the Q1 2015 earnings call and eight were published subsequent to the Q2 2015 earnings call.
53. Taking into account the additional analyst reports published after the Q1 2015 earnings call does not change my conclusion that few analysts changed their recommendation at the time. In my initial report, I showed that of the 38 analysts that released reports within five business days following the Q1 2015 earnings call, only five downgraded their recommendations.⁸⁹ Additionally, three of those 38 analysts upgraded their recommendations, with the remaining 30 maintaining their previous recommendations.⁹⁰ As shown in Exhibit 1, of the three additional analysts, one is a downgrade (Axiom), with the other two (Arete and Monness) maintaining their previous recommendations.⁹¹ Therefore, in total, six analysts downgraded, three upgraded, and 32 maintained.
54. Moreover, taking into account the eight additional analyst reports published after the Q2 2015 earnings call does not change my findings that no analyst firm lowered their

⁸⁷ Stabler, Peter, *et al.*, “Twitter, Inc. – TWTR: No Easy Fix To User Growth Issue,” *Wells Fargo Securities*, July 29, 2015, TWTR_SHEN_00005322, p. 2. (“Clear evidence was offered when CFO Noto revealed to investors that Twitter’s DAU/MAU ratio had declined to 44% in the quarter from the 48% figure (for the first 3 quarters of 2014). The DAU/MAU ratio is highly important as daily engagement is a key ingredient in driving advertising impression growth (along with MAU and ad-load growth).”).

⁸⁸ In my initial report I wrote “only two analysts (Rosenblatt Securities and Wells Fargo) of the 53 analysts that covered Twitter at some point during the period from the beginning of 2014 through the end of the Class Period whose reports I reviewed, ever expressed that the metric was important to them in understanding the Company’s value, or suggested that the Company should start disclosing it.” (Dirks Report, ¶ 89). However, as is evident later in my initial report (*see* Dirks Report, ¶ 90), Barclays should have been included among that group as well, for a total of three analysts. The change from 53 total analysts covering Twitter to 56 is a result of the additional reports considered in the Feinstein Report.

⁸⁹ Dirks Report, ¶ 88 and Exhibit 4.

⁹⁰ In preparing my rebuttal report, I realized that I had misclassified the Morningstar report as an upgrade in my initial report when in fact it was a maintain.

⁹¹ There was also an additional Stifel report dated April 30, 2015 where the recommendation was maintained. However, Stifel issued another report on May 3, 2015 where it upgraded its recommendation, as reflected in my initial report (*see* Dirks Report, ¶ 88 and Exhibit 4). Therefore, I do not include the April 30, 2015 Stifel report in Exhibit 1.

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recommendation regarding Twitter's stock within five days after that call. As shown in Exhibit 2, all eight maintained their previous recommendation, as did nearly all of the analysts considered in my initial report (with the only exceptions being upgrades),⁹² suggesting that no analyst considered the information disclosed on that date as significantly altering their views of Twitter at that time.

55. These additional analyst reports also do not meaningfully change the findings discussed in my initial report and Exhibit 5C. After including the four additional reports that were published subsequent to the Q1 2015 earnings call, my analysis still shows that very few analyst reports (four of 47) issued in the five business days after the Q1 2015 earnings call mentioned Mr. Noto's comment that the DAU/MAU ratios by market were similar to what they were at Analyst Day.⁹³ Exhibit 3A, attached to this report, provides these updated results. As discussed in my initial report,⁹⁴ of those four, three simply repeated Mr. Noto's comment offering no analysis on it, with only Rosenblatt offering any substantive commentary.⁹⁵
56. Taking into account these analyst reports also does not meaningfully change the results set forth in my initial report and Exhibit 5D thereto that only around half the analysts (19 of 37) who issued reports in the five business days following the Q2 2015 earnings call mentioned the DAU/MAU ratio, despite Twitter's disclosure that the ratio for its top 20 markets had declined to 44% from 48% as reported at Analyst Day.⁹⁶ Exhibit 3B, attached

⁹² Dirks Report, ¶ 93 and Exhibit 6.

⁹³ A report by Arete discusses DAU but does not mention Mr. Noto's comment. Kramer, Richard and Rocco Strauss, "Internet: Goliaths Pummel Davids," *Arete*, May 5, 2015.

⁹⁴ Dirks Report, ¶ 91.

⁹⁵ Pyykkonen, Martin, "Downgrading to Neutral; Limited Execution in Key Areas," *Rosenblatt Securities*, April 29, 2015, p. 2. ("Twitter had indicated late last year that the DAU/MAU ratio was in a low 50s percent to high 40s percent range for its top 5-20 geographic markets. As with Facebook, which reports DAUs and MAUs in total and specifically for mobile, we think DAU/MAU would be a proxy for usage and engagement frequency. Twitter's DAU/MAU ratio was ~48% in its top 20 markets as of late last year and Twitter's top 20 markets represent ~90% of total revenue and ~80% MAUs. This obviously shows the top markets dominate Twitter's revenue base, but we also think Twitter's long term DAU/MAU should be expected to increase further as a key usage metric as Twitter's initiatives to drive the more casual and frequent user base take hold.").

⁹⁶ I identified these reports by searching for all analyst reports published in the five business days after the Q2 2015 earnings call that mentioned "DAU," "daily active user," or "daily user." I then reviewed these reports to determine whether they were discussing the DAU/MAU ratio and, if so, assessed whether the report was simply reporting the same news the company disclosed or providing any further analysis or discussion.

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hereto, provides these updated results. Out of these 19 reports, one did not even mention the change in the DAU/MAU ratio,⁹⁷ and 13 others simply reiterated the magnitude of the decline but offered no analysis of the change.⁹⁸ Only five of the 38 analyst reports discussed the change in the DAU/MAU ratio in any detail.⁹⁹

⁹⁷ Wieser, Brian, "TWTR: Solid 2Q15 Business Trends, Undue Focus on User Growth," *Pivotal Research Group*, July 29, 2015, TWTR_SHEN_00005256, p. 1. ("User growth is not necessary to support ongoing revenue and profit growth that more-than justifies current valuation levels, although we recognize that churn reduction and ongoing efforts to increase the ratio of daily active users to monthly active users are necessary for Twitter to retain its standing.")

⁹⁸ See, e.g., Blackledge, John, *et al.*, "2Q15 Results Good Financial Results, User Issues Concerning," *Cowen and Company*, July 29, 2015, TWTR_SHEN_00005071, p. 1. ("Additional mgmt. comments said DAU to MAU ratio in top 20 cities has fallen to 44% versus 48% in the first 3Q's of 2014."); Nowak, Brian, *et al.*, "Twitter Inc. - Fewer Birds: Price Target to \$36," *Morgan Stanley*, July 29, 2015, p. 1 ("As detailed below, 2Q MAU trends were weaker than expected and management talked down near-term MAU growth. In addition, engagement is falling, as the DAU / MAU ratio has fallen 400bp since 3Q14..."); Bhatia, Arvind, and Brett Strauser, "Twitter, Inc. - Strong Monetization offset by Anemic User Growth, Declining Engagement. Raising Full Yr Est. slightly on 2Q Upside," *Sterne Agee*, July 29, 2015, TWTR_SHEN_00295753, p. 1. ("While TWTR is no longer providing Timeline Views, management did indicate that DAUs/MAUs in the top 20 markets were 44% down from 48% disclosed at the analyst day in November last year."); Pitz, Brian, *et al.*, "User Growth, Management Uncertainty Cloud the Near Term," *Jefferies*, July 29, 2015, TWTR_SHEN_00005334, p. 1. ("Additionally, the DAU / MAU ratio for the top 20 markets was 44% in 2Q15 vs. the 48% reported at the Nov. analyst day. Interim CEO Dorsey pointed to 3 areas to improve MAU growth 1) more disciplined execution 2) simplifying TWTR and 3) better communicating the value of TWTR.")

⁹⁹ Mahaney, Mark S., *et al.*, "TWTR Has Hit a Wall ..." *RBC Capital Markets*, July 28, 2015, TWTR_SHEN_00005270, p. 3. ("Twitter no longer discloses Timeline Views/MAU, the company's former self-defined measure of user engagement. As a result, it will be more challenging to track whether engagement levels are rising or falling at the company. However, management stated that the DAU/MAU ratio is 44%, below the 48% disclosed at the Analyst Day last November, due to management's focus on growing the denominator. The company did say that ad engagements grew 57% and Autoplay Video Ads are a more engaging product. We believe engagement should eventually rise, IF the company's product/user interface improvements work and the company effectively communicates value to the mass market...But the takeaway here appears to be that both User growth AND Engagement have hit walls."); Stabler, Peter, *et al.*, "Twitter, Inc. - TWTR: No Easy Fix To User Growth Issue," *Wells Fargo Securities*, July 29, 2015, TWTR_SHEN_00005322, p. 2. ("Clear evidence was offered when CFO Noto revealed to investors that Twitter's DAU/MAU ratio had declined to 44% in the quarter from the 48% figure (for the first 3 quarters of 2014). The DAU/MAU ratio is highly important as daily engagement is a key ingredient in driving advertising impression growth (along with MAU and ad-load growth)."); Sena, Ken, Conor McDade, and Andrew McNellis, "Waiting for (Project) Lightning to Strike," *Evercore ISI*, July 28, 2015, TWTR_SHEN_00005098, p. 1. ("Twitter reported 316mm MAUs inclusive of SMS users (15% y/y or 3% q/q), largely in-line with our estimates, but core user growth of just 2mm q/q to 304mm was well below our 310mm estimate and reflected growth of just 0.7% q/q relative to the 5% reported in 1Q. Meanwhile, commentary that DAUs as a % of MAUs now stands at 44% vs. the 48% last year implies that highly engaged users that check the service daily are growing even more slowly (or -6% y/y for DAUs vs. 15% reported for MAUs). As result, we are no longer modeling a user growth inflection and instead are awaiting more tangible signs of improvement where we are optimistic that Project Lightning, its Search deal with Google, and other such initiatives will contribute."); Kirjner, Carlos, Andrea Rosso, and Ben Betcher, "Twitter 2Q15 Review: Stock Won't Work If Users Don't Grow," *Bernstein*, July 29, 2015, TWTR_SHEN_00005174, p. 2. ("Engagement is not improving. The ratio of DAUs to MAUs dropped to 44% (vs. 48% in 3Q14), making it difficult to make the case that engagement of the existing user base has improved. This ratio is a very imperfect metric for user engagement, but, if anything, it points to declining user engagement. This decline in the ration [*sic*] of DAUs to

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57. Overall, my comprehensive review of analyst reports, in contrast with Dr. Feinstein's selective portrayal, continues to show that few analysts placed any emphasis on the DAU/MAU ratio.

Respectfully submitted, this 7th day of August 2019,



Martin Dirks

MAUs, in addition to Twitters' weak user growth and the CFO's negative comments on the prospects of user reacceleration suggest Twitter is not on track to reach its stated objective to become 'the largest daily audience in the world,' an objective repeated nearly ten times by management during Twitter's analyst day."); Pyykkonen, Martin, "Still Searching For Mass Market Appeal and Usage," *Rosenblatt Securities*, July 29, 2015, TWTR_SHEN_00005283, p. 1. ("Twitter only provided basic usage metrics, which showed some deceleration in the DAU/ MAU ratio (~40% vs. 48% as of late last year). ... Our key fundamental focus for Twitter continues to be the interplay between MAUs and ad revenue monetization. Until last quarter, Twitter had actually executed better at driving per unit of usage (previously timeline views — TLVs) than it had at driving MAU growth. ... Twitter's DAU/MAU ratio in its top 20 markets was ~40%, which indicates some deceleration in usage (vs. ~48% for the first nine months of last year). While TLVs were not a perfect usage metric, it at least gave some indication of usage/engagement performance, which we continue to think is relatively more important than just basic user (MAU) growth ... The core symptom of Twitter's problem is the need to drive user growth (MAUs) and even more importantly to drive usage (frequency, engagement, etc.), especially from more casual users than is currently the case with Twitter's seemingly dedicated and maybe even cult-like base of active users.").

Appendix A

List of Documents Considered

Court Documents

Doris Shenwick et al., Plaintiff v. Twitter Inc. et al., Defendants. United States District Court, Northern District of California, Case No. 3:16-cv-05314-JST Lead Plaintiff's Consolidated Amended Class Action Complaint, filed March 2, 2017.

Doris Shenwick et al., Plaintiff v. Twitter Inc. et al., Defendants. United States District Court, Northern District of California, Case No. 16-cv-05314-JST Order Granting in Part and Denying in Part Defendants' Motion to Dismiss, filed October 16, 2017.

Expert Reports

Expert Report of Martin Dirks, June 21, 2019.

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Exhibit 1
Summary of Analyst Recommendations Issued Within Five Business Days After Twitter’s Q1 2015 Earnings Call
Additional Reports Included in Feinstein Report

Analyst	Date	Recommendation	Change in Recommendation
[1] Axiom	4/29/2015	Hold	Downgraded
[2] Monness Crespi Hardt	4/29/2015	Neutral	Maintained
[3] Arete	5/5/2015	Negative	Maintained

Total Analyst Recommendations:	3
Upgraded	0
Maintained	2
Downgraded	1

Note:
This analysis considers 3 analyst reports issued within 5 business days after Twitter's Q1 2015 earnings call that were considered by Dr. Feinstein but not included in my initial report. There was an additional Stifel report dated April 30, 2015 where the recommendation was maintained. However, Stifel issued another report on May 3, 2015 where it upgraded its recommendation, as reflected in my initial report (see Dirks Report, ¶ 88 and Exhibit 4). Therefore, I do not include the April 30, 2015 Stifel report in this exhibit.

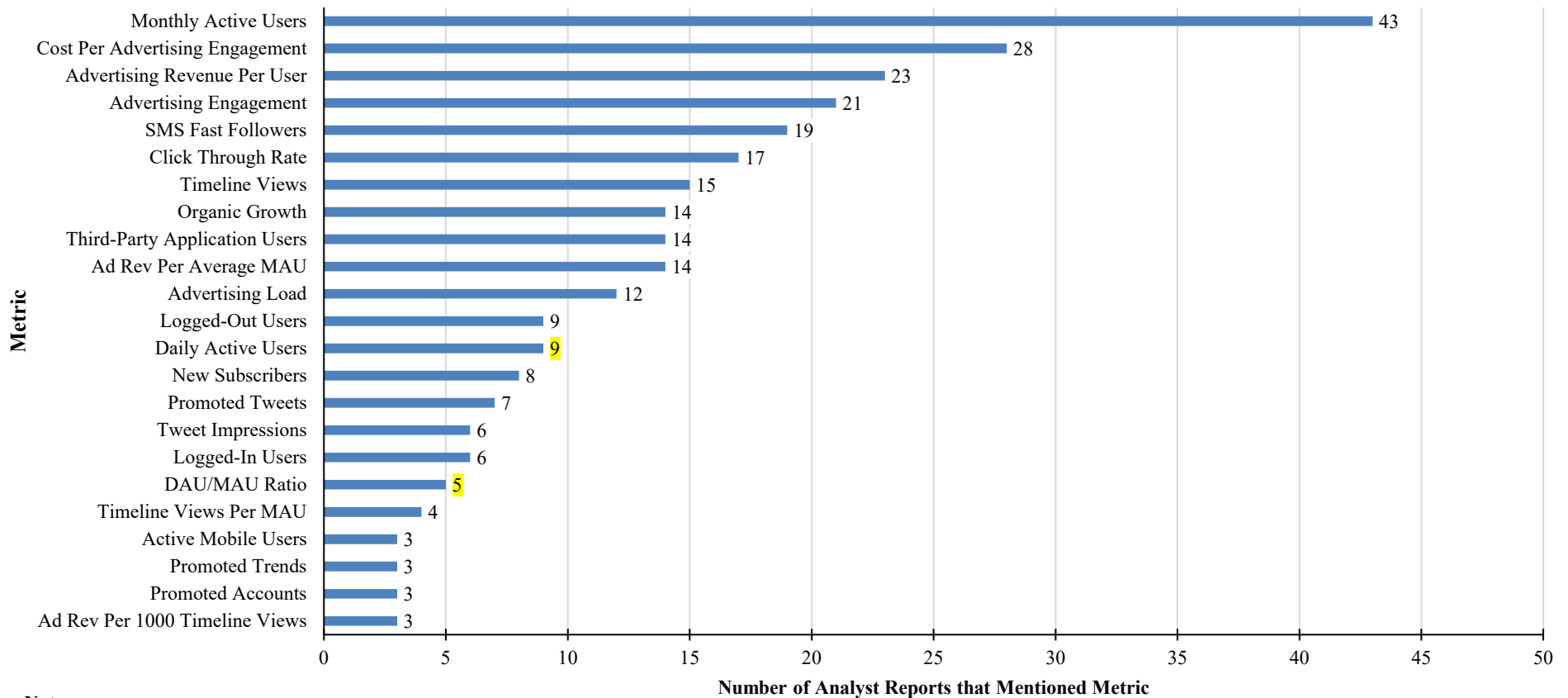
Exhibit 2
Summary of Analyst Recommendations Issued Within Five Business Days After Twitter’s Q2 2015 Earnings Call
Additional Reports Included in Feinstein Report

Analyst	Date	Recommendation	Change in Recommendation
[1] Citi	7/28/2015	Neutral	Maintained
[2] Pacific Crest Securities	7/28/2015	Overweight	Maintained
[3] Stifel	7/28/2015	Hold	Maintained
[4] Atlantic Equities	7/29/2015	Neutral	Maintained
[5] Bank of America Merrill Lynch	7/29/2015	Neutral	Maintained
[6] Bernstein	7/29/2015	Market Perform	Maintained
[7] Nomura	7/29/2015	Neutral	Maintained
[8] Rosenblatt	7/29/2015	Neutral	Maintained

Total Analyst Recommendations:	8
Upgraded	0
Maintained Buy/Outperform/Overweight	1
Maintained Neutral/Hold/Perform/Equal Weight	7
Downgraded	0

Note:
This analysis considers the 8 analyst reports issued within 5 business days after Twitter's Q2 2015 earnings call that were considered by Dr. Feinstein but not included in my initial report.

Exhibit 3A
Metrics Mentioned in at Least 3 of the 47 Analyst Reports Issued After Twitter's Q1 2015 Earnings Announcement
April 28, 2015 - May 5, 2015

**Notes:**

[1] The analysis is based on analyst reports released within five business days after Twitter's Q1 2015 earnings announcement (April 28, 2015).

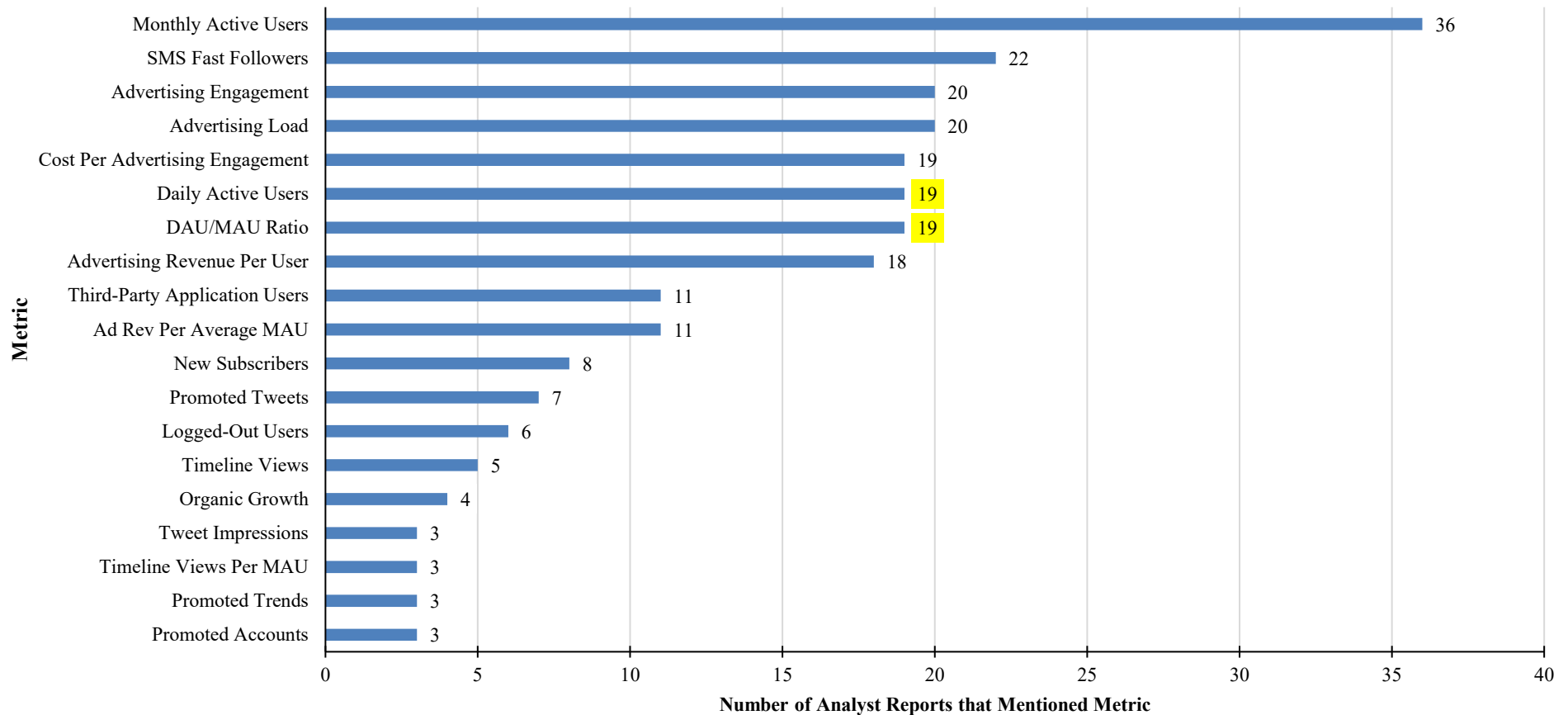
[2] For reports released the day of the earnings announcement, only reports that were issued after the announcement are included in the search.

[3] The analysis relies on 45 metrics that are identified in analyst reports by related search terms (e.g., DAU, Daily Users, Daily User Base, and Daily Active Users for Daily Active Users). See Exhibit 5F of the Dirks Report for the list of metrics.

[4] Counts for a given metric may include other metrics as well. For example, the mentions of the DAU/MAU Ratio are included in the counts for Daily Active Users and Monthly Active Users.

Source: See Exhibit 3C.

Exhibit 3B
Metrics Mentioned in at Least 3 of the 37 Analyst Reports Issued After Twitter's Q2 2015 Earnings Announcement
July 28, 2015 - August 4, 2015



Notes:

[1] The analysis is based on analyst reports released within five business days after Twitter's Q2 2015 earnings announcement (July 28, 2015).

[2] For reports released the day of the earnings announcement, only reports that were issued after the announcement are included in the search.

[3] The analysis relies on 45 metrics that are identified in analyst reports by related search terms (e.g., DAU, Daily Users, Daily User Base, and Daily Active Users for Daily Active Users). See Exhibit 5F of the Dirks Report for the list of metrics.

[4] Counts for a given metric may include other metrics as well. For example, the mentions of the DAU/MAU Ratio are included in the counts for Daily Active Users and Monthly Active Users.

Source: See Exhibit 3C.

Exhibit 3C

List of Sources for Exhibits 3A-B

Analyst Reports Following Q1 2015 Earnings Release

[1] Canaccord Genuity, April 28, 2015.	TWTR_SHEN_00001288
[2] Evercore ISI, April 28, 2015.	TWTR_SHEN_00001315
[3] Goldman Sachs, April 28, 2015.	TWTR_SHEN_00001373
[4] Macquarie Research, April 28, 2015.	TWTR_SHEN_00001305
[5] Pacific Crest Securities, April 28, 2015.	TWTR_SHEN_00001295
[6] RBC Capital Markets, April 28, 2015.	TWTR_SHEN_00001346
[7] Stifel, April 28, 2015.	TWTR_SHEN_00001336
[8] UBS Research, April 28, 2015.	TWTR_SHEN_00001397
[9] UBS Research, April 28, 2015.	TWTR_SHEN_00001360
[10] Wedbush, April 28, 2015.	TWTR_SHEN_00001102
[11] Atlantic Equities, April 29, 2015.	TWTR_SHEN_00001170
* [12] Axiom, April 29, 2015.	TWTR_SHEN_00242537
[13] Baird, April 29, 2015.	TWTR_SHEN_00001090
[14] Bank of America Merrill Lynch, April 29, 2015.	TWTR_SHEN_00001186
[15] Barclays, April 29, 2015.	TWTR_SHEN_00001274
[16] Bernstein, April 29, 2015.	TWTR_SHEN_00001325
[17] BMO Capital Markets, April 29, 2015.	TWTR_SHEN_00112144
[18] Brean Capital, April 29, 2015.	TWTR_SHEN_00001138
[19] Cantor Fitzgerald, April 29, 2015.	
[20] Cowen And Company, April 29, 2015.	TWTR_SHEN_00001197
[21] Deutsche Bank, April 29, 2015.	TWTR_SHEN_00001261
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[30] Nomura, April 29, 2015.	TWTR_SHEN_00001211
[31] Oppenheimer, April 29, 2015.	TWTR_SHEN_00001232
[32] Pivotal Research Group, April 29, 2015.	TWTR_SHEN_00001382
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[36] Stifel, April 29, 2015.	TWTR_SHEN_00001056
[37] Suntrust Robinson Humphrey, April 29, 2015.	TWTR_SHEN_00001118
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[39] Wells Fargo, April 29, 2015.	TWTR_SHEN_00001161
[40] Wunderlich Securities, April 29, 2015.	TWTR_SHEN_00001153
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[43] Suntrust Robinson Humphrey, April 30, 2015.	TWTR_SHEN_00001049
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[45] Stifel, May 03, 2015.	TWTR_SHEN_00001011
[46] Zacks Investment Research, May 04, 2015.	
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Exhibit 3C

List of Sources for Exhibits 3A-B

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[48] Canaccord Genuity, July 28, 2015.	TWTR_SHEN_00005054
* [49] Citi, July 28, 2015.	TWTR_SHEN_00005061
[50] Evercore ISI, July 28, 2015.	TWTR_SHEN_00005098
[51] Macquarie Research, July 28, 2015.	TWTR_SHEN_00005226
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* [54] Stifel, July 28, 2015.	TWTR_SHEN_00005288
[55] UBS Research, July 28, 2015.	
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* [58] Bank of America Merrill Lynch, July 29, 2015.	TWTR_SHEN_00005149
[59] Barclays, July 29, 2015.	TWTR_SHEN_00005161
* [60] Bernstein, July 29, 2015.	TWTR_SHEN_00005174
[61] BMO Capital Markets, July 29, 2015.	TWTR_SHEN_00005186
[62] Brean Capital, July 29, 2015.	TWTR_SHEN_00005039
[63] Cantor Fitzgerald, July 29, 2015.	TWTR_SHEN_00295741
[64] S&P CapitalIQ, July 29, 2015.	
[65] Cowen And Company, July 29, 2015.	TWTR_SHEN_00005071
[66] Deutsche Bank, July 29, 2015.	TWTR_SHEN_00005085
[67] FBN Securities, July 29, 2015.	TWTR_SHEN_00005107
[68] Jefferies, July 29, 2015.	TWTR_SHEN_00005334
[69] JMP Securities, July 29, 2015.	TWTR_SHEN_00005206
[70] JP Morgan, July 29, 2015.	TWTR_SHEN_00005215
[71] Morgan Stanley, July 29, 2015.	
[72] Morningstar, July 29, 2015.	
* [73] Nomura, July 29, 2015.	TWTR_SHEN_00005236
[74] Oppenheimer, July 29, 2015.	TWTR_SHEN_00005246
[75] Pivotal Research Group, July 29, 2015.	TWTR_SHEN_00005256
* [76] Rosenblatt, July 29, 2015.	TWTR_SHEN_00005283
[77] Sterne Agee, July 29, 2015.	TWTR_SHEN_00295753
[78] Suntrust Robinson Humphrey, July 29, 2015.	TWTR_SHEN_00005298
[79] Wells Fargo, July 29, 2015.	TWTR_SHEN_00005322
[80] Zacks Investment Research, July 29, 2015.	
[81] Trefis, July 30, 2015.	
[82] Morningstar, August 03, 2015.	
[83] Topeka Capital Markets, August 03, 2015.	
[84] Suntrust Robinson Humphrey, August 04, 2015.	

Note:

[1] Reports flagged with an asterisk are incremental to sources listed in Exhibit 5E of the Dirks Report.